051-114

JOURNAL OF CELLULAR PHYSIOLOGY

A WISTAR INSTITUTE PRESS JOURNAL PUBLISHED BY ALAN R. LISS, INC.

VITTORIO DEFENDI, *Editor-in-Chief*
New York University Medical Center • Department of Pathology
550 First Avenue • New York, New York 10016

EDITORS

RENATO BASERGA
Temple University

E.A. McCULLOCH
University of Toronto

DANIEL RIFKIN
New York University

PHILIP I. MARCUS
University of Connecticut

HAROLD L. MOSES
Vanderbilt University

P. SIEKEVITZ
The Rockefeller University

ASSOCIATE EDITORS

JOHN W. ADAMSON
University of Washington

GUENTER ALBRECHT-BUEHLER
Northwestern University

CLAUDIO BASILICO
New York University

LAWRENCE A. CHASIN
Columbia University

STANLEY COHEN
Vanderbilt University School of Medicine

DENNIS D. CUNNINGHAM
University of California at Irvine

KURT HIRSCHHORN
Mount Sinai Medical Center

RUDOLF JAENISCH
Heinrich-Pette-Institute für Experimentelle Virologie und Immunologie an der Universität Hamburg

HERMAN M. KALCKAR
Boston University

MORRIS J. KARNOVSKY
Harvard University Medical Center

ARNOLD J. LEVINE
Princeton University

I. LIEBERMAN
University of Pittsburgh

D. MARSLAND *(Emeritus)*
3523 Loquat Avenue
Miami

GEORGE M. MARTIN
University of Washington

D. MAZIA
University of California at Berkeley

M.L. MENDELSOHN
Lawrence Livermore Laboratory

DONALD METCALF
Walter and Eliza Hall Institute

IRA PASTAN
National Cancer Institute

P.G.W. PLAGEMANN
University of Minnesota

RUSSELL ROSS
University of Washington

GIOVANNI ROVERA
The Wistar Institute

E. RICHARD STANLEY
Albert Einstein College of Medicine

CLIFFORD STANNERS
McGill University

GARY S. STEIN
University of Florida at Gainsville

I. BERNARD WEINSTEIN
Columbia University College of Physicians and Surgeons

KENNETH M. YAMADA
National Cancer Institute

COPYRIGHT © 1986 BY ALAN R. LISS, INC.
All Rights Reserved

VOLUME 128
JULY, AUGUST, SEPTEMBER 1986

Contents

No. 1 JULY 1986

LARISA TSAVALER, BARRY S. STEIN, AND HOWARD S. SUSSMAN. Demonstration of the Specific Binding of Bovine Transferrin to the Human Transferrin Receptor in K562 Cells: Evidence for Interspecies Transferrin Internalization 1

THOMAS A. HAMILTON, MARILYN M. JANSEN, SCOTT D. SOMERS, AND DOLPH O. ADAMS. Effects of Bacterial Lipopolysaccharide on Protein Synthesis in Murine Peritoneal Macrophages: Relationship to Activation for Macrophage Tumoricidal Function 9

JAULANG HWANG, J. POUYSSEGUR, M.C. WILLINGHAM, AND I. PASTAN. The Role of Intracellular pH in Ligand Internalization 18

JACK FERRIER, ANGELA WARD, JUNYA KANEHISA, AND JOHAN N.M. HEERSCHE. Electrophysiological Responses of Osteoclasts to Hormones 23

KUANG YU CHEN AND ZEE-FEN CHANG. Age Dependency of the Metabolic Conversion of Polyamines Into Amino Acids in IMR-90 Human Embryonic Lung Diploid Fibroblasts 27

SERGIO GRINSTEIN, WENDY FURUYA, AND EDWARD J. CRAGOE, JR. Volume Changes in Activated Human Neutrophils: The Role of Na^+/H^+ Exchange 33

NOBUHIRO KIMURA AND TAK W. MAK. Isolation and Characterization of an Erythroid Cell Line Highly Inducible to Form Erythroid Burst-Like Colonies 41

CHERYL A. CONOVER, RON G. ROSENFELD, AND RAYMOND L. HINTZ. Hormonal Control of the Replication of Human Fetal Fibroblasts: Role of Somatomedin C/Insulin-Like Growth Factor I 47

JESSE W. BOWEN AND CHARLES LEVINSON. Phosphate Transport in Ehrlich Ascites Tumor Cells: Inhibition by H^+ 55

MATT P. MARINKOVICH AND VICTOR ROCHA. Collagen Synthesis and Deposition During Mammary Epithelial Cell Spreading on Collagen Gels 61

ANNELISE WOHLWEND, JEAN-DOMINIQUE VASSALLI, DANIEL BERTRAND, AND LELIO ORCI. Calcitonin and Vasopressin Affect Epithelial Properties in a Renal Cell Line 71

MICHAEL J. WARBURTON, ROSEMARY KIMBELL, PHILIP S. RUDLAND, SHARON A. FERNS, AND ROGER BARRACLOUGH. Control of Type IV Collagen Production in Rat Mammary Epithelial and Myoepithelial-Like Cells 76

GARY W. ZIEVE AND BARRY E. SLITZKY. Removal of Cellular Water Prevents the Reformation of the Interphase Nucleus 85

JOE G.N. GARCIA, ALMA SIFLINGER-BIRNBOIM, RENA BIZIOS, PETER J. DEL VECCHIO, JOHN W. FENTON II, AND ASRAR B. MALIK. Thrombin-Induced Increase in Albumin Permeability Across the Endothelium 96

D.J. ORLICKY, M. SILIO, C. WILLIAMS, J. GORDON, AND L.E. GERSCHENSON. Regulation of Inositol Phosphate Levels by Prostaglandins in Cultured Endometrial Cells 105

MICHAEL S. MALONEY. Concanavalin A Inhibits Oral Regeneration in *Stentor coeruleus* Through a Mechanism Involving Binding to the Cell Surface 113

W.J. ARMITAGE. Permeability of Human Blood Platelets to Glycerol 121

GEORGE A. FISHER, ROBIN L. ANDERSON, AND GEORGE M. HAHN. Glucocorticoid-Induced Heat Resistance in Mammalian Cells 127

J.G.J. BAUMAN, G. WAGEMAKER, AND J.W.M. VISSER. A Fractionation Procedure of Mouse Bone Marrow Cells Yielding Exclusively Pluripotent Stem Cells and Committed Progenitors 133

No. 2 AUGUST 1986

H.S. Cheung, J.J. Van Wyk, W.E. Russell, and D.J. McCarty. Mitogenic Activity of Hydroxyapatite: Requirement for Somatomedin C 143

Alice Y.-C. Liu, Zee-Fen Chang, and Kuang Yu Chen. Increased Level of cAMP-Dependent Protein Kinase in Aging Human Lung Fibroblasts 149

Yoshiyuki Hakeda, Takahiko Yoshino, Yoshinori Natakani, Noriyoshi Kurihara, Norihiko Maeda, and Masayoshi Kumegawa. Prostaglandin E_2 Stimulates DNA Synthesis by a Cyclic AMP-Independent Pathway in Osteoblastic Clone MC3T3-E1 Cells 155

Nika V. Ketis, Richard L. Hoover, and Morris J. Karnovsky. Isolation of Bovine Aortic Endothelial Cell Plasma Membranes: Identification of Membrane-Associated Cytoskeletal Proteins 162

Zamir S. Brelvi and George P. Studzinski. Inhibition of DNA Synthesis by an Inducer of Differentiation of Leukemic Cells, 1 Alpha, 25 Dihydroxy Vitamin D_3, Precedes Down Regulation of the c-myc Gene 171

N.A. Nicola and D. Metcalf. Binding of Iodinated Multipotential Colony-Stimulating Factor (Interleukin-3) to Murine Bone Marrow Cells 180

Donald Bottaro, David Shepro, Scott Peterson, and Herbert B. Hechtman. Serotonin, Norepinephrine, and Histamine Mediation of Endothelial Cell Barrier Function In Vitro 189

Joel Swanson, Brian Yirinec, Eugene Burke, Anne Bushnell, and Samuel C. Silverstein. Effect of Alterations in the Size of the Vacuolar Compartment on Pinocytosis in J774.2 Macrophages 195

Charles C. Bascom, Behrooz G. Sharifi, and Terry C. Johnson. Receptor Occupancy by a Bovine Sialoglycopeptide Inhibitor Correlates With Inhibition of Protein Synthesis 202

James E. Olson, Raman Sankar, David Holtzman, Adrian James, and Deborah Fleischhacker. Energy-Dependent Volume Regulation in Primary Cultured Cerebral Astrocytes 209

Joan Massagué and Brenda Kelly. Internalization of Transforming Growth Factor-β and Its Receptor in BALB/c 3T3 Fibroblasts 216

H.P. Ehrlich, J.B.M. Rajaratnam, and T.R. Griswold. ATP-Induced Cell Contraction in Dermal Fibroblasts: Effects of cAMP and Myosin Light-Chain Kinase 223

James F. Eliason. Granulocyte-Macrophage Colony Formation in Serum-Free Culture: Effects of Purified Colony-Stimulating Factors and Modulation by Hydrocortisone 231

Peter T. Guidon, Jr. and Lawrence E. Hightower. The 73 Kilodalton Heat Shock Cognate Protein Purified From Rat Brain Contains Nonesterified Palmitic and Stearic Acids 239

John A. Yee, Julie K. Sutton, Ronald L. Shew, and Leann Olansky. Parathyroid Hormone Stimulation of Alkaline Phosphatase Activity in Cultured Neonatal Mouse Calvarial Bone Cells: Involvement of Cyclic AMP and Calcium 246

Robert C. Penhallow, Anne Brown-Mason, and Robert C. Woodworth. Comparative Studies of the Binding and Growth-Supportive Ability of Mammalian Transferrins in Human Cells 251

Sandford Jaques, Jr. and Michael C. Tobes. Morphologic and Biochemical Variability of Tissue and Cultured Cells From Human Pheochromocytoma 261

Hisao Takayama, Takahiko Tanigawa, Yoshinori Tanaka, and Genki Kimura. Induction of Fibronectin Expression, Actin Cable Formation, and Entry Into S Phase Following Reexpression of T Antigen in Mouse Macrophages Transformed by the *ts*A640 Mutant of SV40 271

Arun Malhotra, Jack Kruuv, and James R. Lepock. Sensitization of Rat Hepatocytes to Hyperthermia by Calcium 279

IAN G. SCOTT, KARL E.O. ÅKERMAN, JARI E. HEIKKILÄ, KAI KAILA, AND LEIF C. ANDERSSON. Development of a Neural Phenotype in Differentiating Ganglion Cell-Derived Human Neuroblastoma Cells 285

MINORU MORIKAWA. Sensitivity of Preadipose 3T3 Cells to Growth Hormone 293

MATIA BAR-NER, MICHAEL MAYER, VOLKER SCHIRRMACHER, AND ISRAEL VLODAVSKY. Involvement of Both Heparanase and Plasminogen Activator in Lymphoma Cell-Mediated Degradation of Heparan Sulfate in the Subendothelial Extracellular Matrix 299

SUSAN LINKHART, SUBBURAMAN MOHAN, THOMAS A. LINKHART, MASAYOSHI KUMEGAWA, AND DAVID J. BAYLINK. Human Skeletal Growth Factor Stimulates Collagen Synthesis and Inhibits Proliferation in a Clonal Osteoblast Cell Line (MC3T3-E1) . . 307

DENNIS G. FRY, LONNIE D. MILAM, VERONICA M. MAHER, AND J. JUSTIN MCCORMICK. Transformation of Diploid Human Fibroblasts by DNA Transfection With the v-*sis* Oncogene 313

D.J. HILL, A.J. STRAIN, S.F. ELSTOW, I. SWENNE, AND R.D.G. MILNER. Bi-Functional Action of Transforming Growth Factor-β on DNA Synthesis in Early Passage Human Fetal Fibroblasts 322

JEROME M. TEITEL. Specific Inhibition of Endothelial Cell Proliferation by Isolated Endothelial Plasma Membranes 329

ELIOT M. ROSEN, ITZHAK D. GOLDBERG, HOWARD M. SHAPIRO, STEPHEN E. LEVENSON, PATRICIA A. HALPIN, AND DAVID FARAGGI. Strain and Site Dependence of Polyploidization of Cultured Rat Smooth Muscle 337

RAM BANDYOPADHYAY, GARY STEIN, AND JANET STEIN. Localization of Human Histone Gene Transcripts Predominantly in the Nonmatrix Nuclear Fraction 345

No. 3 SEPTEMBER 1986

VICTOR B. HATCHER, NORA FADL-ALLAH, MINDY A. LEVITT, ANDREA BROWN, SARKIS S. MARGOSSIAN, AND PORTIA B. GORDON. Isolation and Partial Characterization of Endothelial Cell Extracellular Complexes. 353

PATRICIO ALLER AND RENATO BASERGA. Selective Increase of c-myc mRNA Levels by Methylglyoxal-bis (Guanylhydrazone) and Novobiocin in Serum-Stimulated Fibroblasts 362

KEN MACKIE, YVONNE LAI, ANGUS C. NAIRN, PAUL GREENGARD, BRUCE R. PITT, AND JOHN S. LAZO. Protein Phosphorylation in Cultured Endothelial Cells 367

NEAL S. BURRES AND CAROL E. CASS. Density-Dependent Inhibition of Expression of Syncytiotrophoblastic Markers by Cultured Human Choriocarcinoma (BeWo) Cells 375

A.P. WARREN, M.H. JAMES, D.E. MENZIES, C.C. WIDNELL, P.A. WHITAKER-DOWLING, AND C.A. PASTERNAK. Stress Induces an Increased Hexose Uptake in Cultured Cells 383

MAURICE GEUSKENS, JAVIER NAVAL, AND JOSÉ URIEL. Ultrastructural Studies of the Intracellular Translocation of Endocytosed Alpha-Foetoprotein (AFP) by Cytochemistry and of the Uptake of ^{3}H-Arachidonic Acid Bound to AFP by Autoradiography in Rat Rhabdomyosarcoma Cells 389

TETSUYA MATSUNO, TEIKICHI SATOH, AND HARUO SUZUKI. Prominent Glutamine Oxidation Activity in Mitochondria of Avian Transplantable Hepatoma Induced by MC-29 Virus 397

R. COLIN HUGHES AND GARY MILLS. Functional Differences in the Interactions of Glycosylation-Deficient Cell Lines With Fibronectin, Laminin, and Type IV Collagen . . 402

JAN-KAN CHEN, SHARON LABRAKE-FARMER, AND DON B. MCCLURE. Purified HDL-Apolipoproteins, A-I and C-III, Substitute for HDL in Promoting the Growth of SV40-Transformed REF52 Cells in Serum-Free Medium 413

D. METCALF, A.W. BURGESS, G.R. JOHNSON, N.A. NICOLA, E.C. NICE, J. DELAMARTER, D.R. THATCHER, AND J.-J. MERMOD. In Vitro Actions on Hemopoietic Cells of Recombinant Murine GM-CSF Purified After Production in *Escherichia coli*: Comparison With Purified Native GM-CSF 421

D.D. MOSSER, J.J. HEIKKILA, AND N.C. BOLS. Temperature Ranges Over Which Rainbow Trout Fibroblasts Survive and Synthesize Heat-Shock Proteins 432

JEAN M. GUDAS, SIRPA O. KARENLAMPI, AND OLIVER HANKINSON. Intracellular Location of the *Ah* Receptor 441

JEAN M. GUDAS AND OLIVER HANKINSON. Reversible Inactivation of the *Ah* Receptor Associated With Changes in Intracellular ATP Levels 449

ERIC M. VERDIN, ELEFTHERIA MARATOS-FLIER, JEAN-LOUIS CARPENTIER, AND C. RONALD KAHN. Persistent Infection With a Nontransforming RNA Virus Leads to Impaired Growth Factor Receptors and Response 457

MICHAEL S. GOLIGORSKY, KEITH A. HRUSKA, DAVID J. LOFTUS, AND ELLIOT L. ELSON. Alpha$_1$-Adrenergic Stimulation and Cytoplasmic Free Calcium Concentration in Cultured Renal Proximal Tubular Cells: Evidence for Compartmentalization of Quin-2 and Fura-2 466

D. GOSPODAROWICZ AND J. CHENG. Heparin Protects Basic and Acidic FGF From Inactivation 475

RENA BIZIOS, LINDA LAI, JOHN W. FENTON II, AND ASRAR B. MALIK. Thrombin-Induced Chemotaxis and Aggregation of Neutrophils 485

PETER G.W. PLAGEMANN. Transport and Metabolism of Adenosine in Human Erythrocytes: Effect of Transport Inhibitors and Regulation by Phosphate 491

N.A. NICOLA, M.A. VADAS, AND A.F. LOPEZ. Down-Modulation of Receptors for Granulocyte Colony-Stimulating Factor on Human Neutrophils by Granulocyte-Activating Agents 501

Erratum

THOMAS L. LETO, BRUCE M. PRATT, AND JOSEPH A. MADRI. Mechanisms of Cytoskeletal Regulation: Modulation of Aortic Endothelial Cell Protein Band 4.1 by the Extracellular Matrix. *127*:423–431, 1986 511

Index to Volume 128 513

JOURNAL OF CELLULAR PHYSIOLOGY

A Wistar Institute Press Journal Published by Alan R. Liss, Inc.

NOTICE TO CONTRIBUTORS

Revised July 1985

Manuscripts and all editorial correspondence should be sent to Dr. Vittorio Defendi, New York University Medical Center, Department of Pathology, 550 First Avenue, New York, New York 10016, USA. **It is required that the letter of submission be signed by all co-authors.**

All manuscripts must be in English. Authors whose "first" language is not English should arrange for their manuscripts to be written in idiomatic English before submission. Either American or British style is acceptable. Submit the original and two clear copies of all elements (including tables and figures) typed on one side of good quality 22 × 28 cm (8½″ × 11″) paper with at least 25 mm (1″) margins. Double space everything. Start a new page for each major division of the manuscript. Number all pages in sequence, beginning with the title page. Arrange the copy in the following order:

TITLE PAGE: This should contain:

- Complete article title
- Names and affiliations of all authors
- Institution(s) at which the work was performed with city, state, and zip code
- Acknowledgments of funding
- Name, address, telephone number, and cable address or Telex number for all correspondence
- A running head of not more than 48 characters
- Total number of text figures and tables.

ABSTRACT: This should summarize the major findings and conclusions in the paper in not more than 250 words compressed into a single paragraph. The abstract will serve in lieu of a concluding summary and should be intelligible without reference to the rest of the paper.

TEXT: The text should follow the format: Abstract, Introduction, Materials and Methods, Results, Discussion, and Acknowledgments. Use subheadings and paragraph titles whenever possible. Define unusual abbreviations at first mention. Units of measure must be written in metric units.

LITERATURE CITED: References in the text to the literature should be made by author's name followed by year of publication:

. . . studies by Briggs (1975) reveal. . .

. . . studies by Briggs and Porter (1975) reveal. . .

If there are more than two authors, use the first author and et al. The final list must be alphabetized and include only references cited in the text. Each entry must include the names of all authors, complete title of the work cited, and inclusive page numbers. Abbreviations of journal titles should follow those used in Index Medicus. Examples:

> Hall, D.J., O'Leary, J.J., Sand, T.T., and Rosenberg, A. (1981) Commitment and proliferation kinetics of human lymphocytes stimulated in vitro: Effects of α-MM addition and suboptimal dose on concanavalin A response. J. Cell Physiol., *108*:25-34.
>
> Zwilling, E. (1961) Limb morphogenesis. In: Advances in Morphogenesis. M. Abercrombie and J. Brachet, eds. Academic Press, New York, Vol. 1, pp. 301-330.

LEGENDS: Each illustration must have a legend and be numbered consecutively with Arabic numerals. Abbreviations pertaining to the labeling of figures should be listed once, alphabetically, and placed before the first figure containing these abbreviations.

TABLES: Each table must be typed on a separate page, be numbered in order of appearance with Arabic numerals, have a title, and be keyed into the text.

ILLUSTRATIONS: Use illustrations sparingly; they should not duplicate information already made clear in the text. Illustrations may be mounted or unmounted. Good quality glossy black and white photographs 5″ × 7″ or 8 × 10″ are preferred; a charge will be made for color. All graphics and lettering must meet professional standards and be legible after reduction in size. Illustrations must be numbered in order of appearance with Arabic numerals and keyed into the text. Name of author, figure number, reduction requested, and an arrow indicating the orientation should be typed on a gummed label and affixed to the back of each illustration. Do not write directly on the back of the photo. If no reduction is desired, an illustration or group of illustrations should not exceed 6¾″ (approximately 17.1 cm) wide by 8¾″ (approximately 22.2 cm) long. Illustrations should be enclosed in an envelope.

All manuscripts submitted to JOURNAL OF CELLULAR PHYSIOLOGY must be submitted solely to this journal, may not have been published in any part or form in another publication of any type, professional or lay, and become the property of the publisher. Any material reproduced or adapted from any other published or unpublished source must be duly acknowledged. It is the author's responsibility to obtain permission to reproduce copyrighted material. Upon acceptance of a manuscript for publication, the author will be requested to sign an agreement transferring copyright to the publisher, who reserves copyright. No published material may be reproduced or published elsewhere without the written permission of the publisher and the author. The journal will not be responsible for the loss of manuscripts at any time. All statements in, or omissions from, published manuscripts are the responsibility of the author, who will assist the editor and publisher by reviewing proofs before publication. Reprint order forms will be sent with the proofs. It is important to order, initially, a sufficient quantity of reprints since the cost is substantially higher if ordered after publication.

To help defray the costs of printing Wistar Institute Press journals, the publisher will request from the author $18 per page for text and tabular material and $9 per page for illustrations, both line drawings and photographs. Such payments are voluntary and are not a prerequisite to the publication of any article. However, because of the very high cost of color work, such work will be initiated only at the author's request and expense.